AMENDMENTS TO THE SPECIFICATION:

Please amend the specification as follows:

Please amend paragraph 5, page 2, as follows:

[005] In accordance with the invention, there is provided an apparatus having a transmitter and a receiver for sensing remote objects. The transmitter comprises ~~N~~J transmitter source elements. The apparatus further comprises a source generator for providing ~~N~~J equal carrier signals and a modulator signal generator for generating ~~N~~J statistically independent chip sequences. Each chip sequence comprises a plurality of chips, each chip having a random phase. Still further, the apparatus comprises a modulator for independently modulating the ~~N~~J equal carrier signals with the ~~N~~J statistically independent chips sequences, respectively, to generate ~~N~~J modulated signals. Each modulated signal comprises a plurality of chips, each chip having a random phase. The ~~N~~J modulated signals are transmitted by the ~~N~~J transmitter source elements, respectively, forming a composite signal beam. The transmitter source elements are separated by approximately 1/2 wavelength.

Please amend paragraph 6, pages 2-3, as follows:

[006] There is also provided a method for sensing remote objects comprising the steps of generating ~~N~~J equal carrier signals and ~~N~~J statistically independent chip sequences. Each chip sequence comprises a plurality of chips, each chip having a random phase. The method further comprises independently modulating the ~~N~~J equal carrier signals with the ~~N~~J statically independent chip sequences, respectively, to generate ~~N~~J modulated signals and then transmitting the ~~N~~J modulated signals, forming a composite signal beam. Each modulated signal comprises a plurality of chips, each chip having a random phase.

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Please amend paragraph 22, pages 7-8, as follows:

[022] Fig. 3C illustrates typical phase modulated signals 310, 320, 330, 340 output by the transmitter modulator 6 and emitted by the transmitter source elements 2. As mentioned above, the transmitter modulator 6 phase modulates, or chips, each signal output from the signal divider 8 with one of the signals generated by the modulator signal generator 5 (Fig. 1A), which may be modified by the modulation signal ~~generator 5~~ modifier 3 (Fig. 1). Each chip of the phase modulated signals 310, 320, 330, 340, equal phase shifted versions of respective signals output from the signal divider 8. For example, using transmitter 101 of Fig. 1A, assume transmitter modulator 6 modulates (or chips) a first signal output from signal divider 8 with signal 302 of Fig. 3A. The resulting signal is signal 310 of Fig. 3C. A first chip of signal 310 equals the first signal output from the signal divider 8 phase shifted by Φ_{11}, the second chip of signal 310 equals the first signal phase shifted by Φ_{12}, and so on. Similarly, signal 320 of Fig. 3C results from transmitter modulator 6 modulating (or chipping) a second signal output from signal divider 8 with signal 304 of Fig. 3A. A first chip of signal 320 equals the second signal output from the signal divider 8 phase shifted by Φ_{21}, the second chip of signal 320 equals the second signal phase shifted by Φ_{22}, and so on. Signals 330 through 340 are generated in a similar manner. For transmitter 100, each chip of the phase modulated signals 310, 320, 330, 340 will be phase modulated using the signals 302', 304', 306', 308', illustrated in Fig. 3B. For an electromagnetic system, the modulation of each signal preferably is a pulse of one microsecond in duration containing 50 phase modulated chips, each of a 20 nanosecond duration. In this example, the carrier frequency is 1 $X10^9$ Hz. For an underwater acoustic system, the modulation of each signal preferably is a pulse of 200 milliseconds in duration containing 50 phase modulated chips, each of four milliseconds duration. In this example, the carrier frequency is 5,000 Hz.

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Please amend paragraph 33, pages 10-11, as follows:

[033] In a second embodiment as illustrated in Fig. 5, receiver 400 further includes a signal waveform memory unit 21 and a receiver control unit 22. The signal waveform memory unit 21 receives inputs from the receiver sensor elements 14 and the receiver control unit 22. The signal waveform memory unit 21 stores a time interval snapshot of the signals received by the receiver sensor elements 14 and subsequently, upon receiving a command from the receiver control unit 22, outputs the received signals to the receiver signal modulator 18. The snapshot may be output multiple times in order to permit the processing of signals for various received signal beam directions using only a ~~signal~~ single beam steering and processing subsystem 20.

Please amend paragraph 36, pages 11-12, as follows:

[036] In a fifth embodiment as illustrated in Fig. 7A, the receiver signal modulator 18 randomizes the phases of the signals received by the receiver sensor elements 14. That is, the receiver signal modulator 18 modulates (or chips) the chips of the signals received by each receive sensor element 14 based on random phase settings from the receiver calculator 4. The relative phase of each element is, therefore, random for each incoming ~~signals~~ signal. That is, care is not taken to achieve any particular phase relationship. The receiver 650 further includes a receiver signal waveform memory 28A and a signal correlator 26A. Receiver beam steering is inherent in the correlation processing.

Please amend paragraph 40, pages 13-14, as follows:

[040] In addition to generating a plurality of phase modulation signals, the receiver calculator 4, based on information received from the

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receiver configuration memory 17 and using the phase values within the plurality of phase modulation signals, calculates an expected received signal. The expected received signal is stored in the receiver signal waveform memory 28A. The expected received signal is a signal that the combined signal from the signal combiner 24 is expected to be if an unmodulated carrier was transmitted and scattered by a remote object from a particular direction relative to receiver sensor elements [[1]] <u>14</u>. For example, referring to Fig. 2, receiver calculator 4 may generate an expected signal for a carrier signal transmitted and scattered by remote object 13.

Please amend paragraph 41, page 14 s follows:

[041] The combined signal from the signal combiner 24 and the expected signal from the receiver signal waveform memory 28A are output to the signal correlator 26A, which correlates the two signals. The correlated signal is input to a second signal correlator 26, where it is correlated with an expected transmitter signal stored in the transmitter signal waveform memory 28. The receiver calculator 4 calculates the expected transmitter signal based on data received from the modulator signal generator 5 and the modulator signal modifier 3 (shown in Figs. 1 and 1A) via the interface connector 36 and the transmitter configuration memory 1 (shown in Figs. 1 and 1A) via the interface connector 37. The expected transmitter signal is a signal that is expected to arrive from a desired direction. This desired direction of the expected transmitter signal may be the direction of signal arrival that the expected receiver signal output from the receiver calculator 4 to receiver signal waveform memory 28A ~~are~~ <u>is</u> based upon.

Please amend paragraph 62, page 19 as follows:

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[062] It is generally easier for signal processors to generate pseudo-random numbers rather than purely random numbers, and thus the term "random" includes "pseudo-random." This pseudo-randomness applies for phase modulation signals Φ that are either continuously variable or limited to a finite number of variables. Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

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